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# **PRATT & WHITNEY**

## **Voluntary Corrective Action Program**

### **Progress Report for Second Quarter 2002**

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**PREPARED FOR**

**U.S. EPA Region I**  
JFK Federal Building  
Boston, MA

**July 2002**



Loureiro Engineering Associates, Inc.

July 3, 2002

**U.S. EPA New England - Region I**

Mail Code HBT

One Congress Street, Suite 1100

Boston, MA 02114-2023

Attn.: Mr. Ernest Waterman

**RE: 23<sup>rd</sup> Progress Report  
Pratt & Whitney Voluntary Corrective Action Program  
LEA Comm. No. 68VA109**


Dear Mr. Waterman:

Please find enclosed four copies of our 23<sup>rd</sup> Voluntary Corrective Action Program Progress Report. As discussed, we will be submitting similar reports on a quarterly basis.

If you have any questions, please call me at (860) 747-6181.

Sincerely,

**LOUREIRO ENGINEERING ASSOCIATES, INC.**

Jeffrey J. LOUREIRO 

Jeffrey J. Loureiro, P.E.  
President

pc: Lauren Levine, United Technologies Corporation  
David Ringquist, CT DEP  
Manu Sharma, Gradient Corporation

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**PRATT & WHITNEY  
VOLUNTARY CORRECTIVE ACTION PROGRAM  
PROGRESS REPORT FOR SECOND QUARTER 2002**

**Prepared for  
U.S. EPA New England - Region I  
JFK Federal Building  
Boston, MA**

**July 2002**

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## **APPENDICES**

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## **ACRONYMS**

CSM	Conceptual Site Model
CT DEP	Connecticut Department of Environmental Protection
DEC	Direct Exposure Criteria
DPR	Design Process Review
EID	Environmental Indicator Determination
EPA	United States Environmental Protection Agency, Region I
LEA	Loureiro Engineering Associates, Inc.
RCRA	Resource Conservation and Recovery Act
RDA	Recommended Daily Allowance
RfD	Reference Dose
SSL	Soil Screening Level
TM	Technical Memorandum
USTM	Unit-Specific Technical Memorandum
UTC	United Technologies Corporation
VCAP	Voluntary Corrective Action Program

**UNITED TECHNOLOGIES CORPORATION  
PRATT & WHITNEY  
Voluntary Corrective Action Program  
Progress Report for Second Quarter 2002**

**1. INTRODUCTION**

**1.1 General**

This Progress Report is the 23<sup>rd</sup> in a series of progress reports to be prepared and issued on a quarterly basis during the Voluntary Corrective Action Program (VCAP). The progress reports are intended to provide the Environmental Protection Agency, Region I (EPA) with an overview of (1) the work performed during the reporting period, (2) a look ahead at activities planned for the next reporting period, and (3) the progress of interim measures being implemented. The progress reports also serve as the vehicle for conveying minutes of the semiannual progress meetings with EPA and for summarizing key program issues that have arisen during the reporting period. The progress reports are not intended as a substitute for technical reports summarizing investigation and/or remediation activities, which will be prepared as appropriate throughout the course of the Program. Please see the individual site discussions for mention of any impending or submitted technical reports.

**1.2 VCAP Schedule and EPA Comments**

Of the five Connecticut Pratt & Whitney VCAP stabilization sites, only two, Willgoos and East Hartford Main Street, have not yet demonstrated compliance with both CA 725 and CA 750. A revised draft Environmental Indicator determination (EID) for Groundwater Migration Under Control for the Willgoos facility was submitted on February 8, 2002. It is anticipated that EPA and UTC will work together towards finalizing the EID, demonstrating stabilization at the site, during the next reporting period. It is anticipated that completion of stabilization activities at the East Hartford Main Street facility will occur in 2003.

Minor changes have been made to the Design Process Review (DPR) threshold soil and groundwater concentrations presented in Tables 3-11 and Table 3-12, respectively, of the Conceptual Site Model Report (CSM), prepared by Gradient Corporation and last revised on September 15, 1999. When any of the DPR threshold concentrations for soil and groundwater are exceeded Pratt & Whitney selects an environmental contractor to perform work instead of a general contractor. The updated tables along with a description of the changes are included in **Appendix A**.



### **1.3        Semiannual Progress Meeting**

No semiannual progress meeting was held during this reporting period. The next meeting is planned for July 2002.

## **2.        COMPLETED INVESTIGATION ACTIVITIES (LAST THREE MONTHS)**

This section provides a brief description of the investigation activities undertaken at each site during the last three months. Maps showing sampling locations updated through the reporting period are provided in the Appendices along with laboratory analytical data tables inclusive of data received through the reporting period, as appropriate.

### **2.1        East Hartford**

#### **2.1.1      Klondike**

EPA, United Technologies Corporation (UTC), and Loureiro Engineering Associates, Inc. (LEA) have been working cooperatively in the preparation of the report for the Airport/Klondike area. For this reason, and to avoid duplication, no additional information is provided in this Progress Report.

#### **2.1.2      Main Plant**

Construction activities associated with the remediation of Willow Brook and Willow Brook Pond continued through this quarter. Activities completed during this reporting period included ongoing dewatering activities within the southern portion of the lower pond, wetland and stream channel areas; operation of the temporary groundwater treatment facility; excavation and offsite disposal of an additional 4,762 tons (project total to date is 65,851 tons) of contaminated soil, sediment, and concrete, from within the limits of the lower pond (primarily the oil basin area) wetlands and stream channel areas; confirmatory sampling and documentary surveys; construction of the engineered control (cap) and related restorations within the southern portion of the lower pond and western portion of the stream channel; and preparation of the fourth quarterly progress report detailing the above activities. A copy of the progress report was delivered to the Connecticut Department of Environmental Protection (CT DEP) and mailed to the EPA on June 28, 2002.

The majority of the remediation and final restoration activities were completed by July 1, 2002. Equipment decontamination and final cleanup are expected to continue into July 2002. In accordance with the approved schedule, the post-remediation report, including the draft Environmental Land Use Restrictions, will be submitted by November 1, 2002.

To date, a total of 65,851 tons of contaminated soil/sediment and debris have been excavated and disposed of off the site. A small volume of additional material is expected upon decommissioning of the final decontamination pads (estimated to be 600 tons). This material will represent the final offsite disposal shipment.



## **2.2 Willgoos**

UTC submitted a revised *Documentation of EID for Current Human Exposures Under Control* for the Pratt & Whitney Willgoos facility located on Pent Road in East Hartford, Connecticut on October 12, 2001. EPA provided formal concurrence to UTC's demonstration that Human Exposures are controlled on December 13, 2001.

Applicable comments received during the finalization of the Human Exposure EID were incorporated into a revised draft *Documentation of EID for Groundwater Migration Under Control*. This revised draft groundwater EID was submitted on February 8, 2002. It is anticipated that EPA and UTC will work together towards finalizing the EID and demonstrating stabilization at the site, during the next reporting period.

In accordance with the groundwater sampling plan, outlined in the Human Exposure EID, groundwater sampling was completed in April 2002 for select wells within the facility's fuel farm, to verify that nearby residential areas are not impacted by the presence of contaminated groundwater. A letter report summarizing the results of this sampling was submitted on June 7, 2002.

## **2.3 Colt Street – Stabilized**

## **2.4 Rocky Hill– Stabilized**

An indoor air monitoring event was performed in April 2002 and the results were presented in a report submitted to EPA during this reporting period.

## **2.5 North Haven - Stabilized**

Groundwater, surface water and indoor air monitoring was performed at the former Pratt & Whitney facility in North Haven, CT in accordance with the *Proposed Stabilization Monitoring Plan*, prepared by LEA and dated April 2002. The intent of the program is to verify that human exposures remain controlled and contaminated groundwater remains within the dimensions of the "existing area of contaminated groundwater". The results of the monitoring were provided in the report entitled, *Stabilization Monitoring, April 2002*, prepared by LEA and dated June 2002.

## **3. PLANNED ACTIVITIES (NEXT THREE MONTHS)**

This section provides a brief description of the investigation activities planned at each site during the next three months.

### **3.1 East Hartford**

#### **3.1.1 Klondike**

Preparation of sections of the summary report documenting the Airport/Klondike investigation and remediation to satisfy the Resource Conservation and Recovery Act (RCRA) Corrective Action requirements will be continuing. Together with the sections of the summary report, presentation of Technical Memoranda (TMs) will continue during future review meetings. All proposed Unit-Specific Technical Memoranda (USTMs), which address the unit-specific soil investigations, have been submitted to EPA. The remaining sections of the summary report will be submitted during the third quarter of 2002.

EPA, UTC, and LEA continue to work cooperatively in the review of documents relating to the North Parcel of the Airport/Klondike. The documents include the North Parcel report (prepared by LEA) documenting investigation/remediation activities performed at the following environmental units: former Silver Lane Pickle Company; the North Klondike Undeveloped Land Outside Storage Area; the North Klondike Undeveloped Land Soil Piles; the former Army Barracks Area; and the Rentschler Airport Area) and the Marin Report (prepared by Marin Environmental Inc. for the Connecticut Office of Policy and Management for the transfer of the Stadium parcel).

The North Parcel includes an approximately 72-acre parcel (Stadium Parcel) and an approximately 3-acre parcel (Supplemental Stadium Parcel) that have been transferred to the State of Connecticut for a football stadium. UTC has submitted a letter to the EPA requesting that the EPA begin the process of releasing the Stadium Parcel from corrective action obligations, based on the prior investigation and the EPA review, indicating that there are no environmental issues on that parcel. UTC made a joint decision with the EPA to include the 3-acre Supplemental Stadium Parcel as part of the release from corrective action obligations since additional remediation activities have been completed on that site. Fuss & O'Neill, Inc, the State's consultant, has prepared a Remedial Action Report documenting these activities and this has been forwarded to the EPA. UTC has also prepared a draft statement of basis for the combined 75-acre Stadium Site and submitted it for the EPA's use.

#### **3.1.2 Main Plant**

Site activities associated with the remediation and restoration of Willow Brook and Willow Brook Pond continued through this quarter. Completion of the project is estimated to occur in July 2002. Planned activities to be performed during the next reporting period include the completion of the soil relocation to the engineered control area, preparation of the areas for capping, completion of restoration activities, decontamination of sheeting and heavy equipment, and the installation of the perimeter fencing.

### **3.2 Willgoos**

It is anticipated that review comments for the February 8, 2002 revised draft *Documentation of Environmental Indicator Determination - Groundwater Migration Under Control* will be



received from the EPA during the next reporting period. It is anticipated that a timeframe for finalization of the groundwater EID will be established upon receipt of EPA's comments.

In accordance with the limited groundwater sampling plan outlined in the October 12, 2001 revised *Documentation of EID for Current Human Exposures Under Control*, groundwater sampling will be performed in August 2002 for select wells within the facility's fuel farm to verify that nearby residential areas are not impacted by the presence of contaminated groundwater.

The next indoor air monitoring event is expected to be performed at the facility in July 2002. The results will be submitted to EPA during the following reporting period.

#### **3.4 Colt Street– Stabilized**

#### **3.5 Rocky Hill– Stabilized**

#### **3.5 North Haven - Stabilized**

The next stabilization monitoring event at the former Pratt & Whitney facility in North Haven Connecticut is scheduled for October 2002.

### **4. INTERIM MEASURES**

This section provides a summary of some of the interim measures undertaken during this VCAP progress-reporting period. UTC/Pratt & Whitney is continuing to collect information on interim measures performed at each site and will provide a summary of any additional interim measures identified in the subsequent progress reports.

No interim measures were performed at the East Hartford, Willgoos, Colt Street, Rocky Hill or North Haven facilities during this reporting period.

## **Appendix A**

### **Development of DPR Threshold Soil and Groundwater Concentrations**



**TABLE 3-11**

- Detection limits for a few compounds listed in Gradient's Table 3-11, have been changed to reflect the lowest method detection limits available.
- Toxicity factor values developed within the last three years have been reviewed to ascertain what effect, if any, these changes would have on the soil screening level (SSL) and DPR values. As a result of this review the SSLs and DPR thresholds have been updated for 2-methylnaphthalene, benzo(g,h,i)perylene, thallium, and titanium.
- The beryllium SSL and DPR thresholds have been updated to reflect EPA's withdrawal of the oral carcinogenicity slope factor.
- The arsenic SSL for excavating laborers has been updated because the previous, risk-based SSL was lower than background concentrations used in the development of the Connecticut Residential and Industrial/Commercial Direct Exposure Criteria (DEC) for soil. Therefore, the SSL for excavating laborers is now set at the DEC value. As a result of these changes, the DPR threshold soil concentration for arsenic is now identical to the corresponding DEC value.
- For magnesium, the Recommended Daily Allowance (RDA) for adult men and women is accepted to be 4.5 mg/kg (NRC, 1989)<sup>1</sup>. When using the RDA as the oral reference dose (RfD) for magnesium, calculated screening levels greatly exceed  $1 \times 10^6$  mg/kg for all receptors (trench worker, groundskeeper, maintenance worker, sampler, trespasser, on-site recreator, and off-site recreator). A screening level greater than one million parts per million indicates that magnesium does not pose a documented risk at any concentration to any receptor. In fact, even when a small fraction of the RDA (15%) is used as the RfD (assuming that only a small portion of the RDA comes from site-related exposures with the balance coming from food) calculated screening levels for all receptors still exceed  $1 \times 10^6$  mg/kg, and, therefore present negligible risks. In addition, magnesium is considered to be an essential nutrient as stated in the Risk Assessment Guidance for Superfund (1989). Therefore, since magnesium is a naturally occurring material that is an essential nutrient with a RDA, magnesium should not be considered a chemical of concern. Based on this rationale, we have dropped magnesium from the sampling program.

**TABLE 3-12**

The hexavalent chromium DPR threshold has been changed to reflect the Contained-in policy groundwater concentration for total chromium, acknowledging that hexavalent chrome is more toxic than trivalent chrome.

<sup>1</sup> National Research Council (U.S.) Subcommittee on the Tenth Edition of the RDAs. 1989. Recommended Dietary Allowances. pp. 187-194.



**Table 3-11**  
**Development of DPR Threshold Soil Concentrations**  
**P&W VCAP, Connecticut Facilities**

	Draft Contained- In Policy Soil Concentration <sup>2</sup>	P&W SSL for Inhalation of Trench Air	P&W SSL for Ingestion & Dermal Contact Excavating Laborer	P&W SSL for Ingestion & Dermal Contact Maintenance Worker	DPR Threshold Soil Concentration
Parameter <sup>1</sup>	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
VOCs					
1,1,1,2-Tetrachloroethane	2	NC	274	4,662	2
1,1,1-Trichloroethane	400	1,200	91,467	NR	400
1,1,2,2-Tetrachloroethane	1	2,000	34	570	1
1,1,2-Trichloroethane	10	1,800	123	2,090	10
1,1-Dichloroethane	140	1,700	254,800	NR	140
1,1-Dichloroethene	9.5	580	11	190	9.5
1,2,3-Trichloropropane	0.82	1,700	1.0	17	0.82
1,2-Dichloroethane	10	1,800	78	1,330	10
1,2-Dichloroethene (cis)	140	1,200	25,480	421,200	140
1,2-Dichloroethene (trans)	200	1,200	52,267	864,000	200
1,2-Dichloropropane	10	1,100	101	1,710	10
1,3-Dichloropropene	1	770	45	760	1
1,4-Dioxane	520	27,270	648	11,020	520
2-Butanone (MEK)	1,000	34,000	NR	NR	1,000
Acetone	1,000	100,000	254,800	NR	1,000
Acetonitrile	210	162,610	15,680	259,200	210
Acrylonitrile	1	3,900	13	224	1
Benzene	10	827	246	4,180	10
Bromodichloromethane (Dichlorobromomethane)	92	NC	112	1,900	92
Bromoform	8	1,900	905	15,390	8
Carbon Disulfide	3,500	1,520	254,800	NR	1,520
Carbon Tetrachloride	10	1,100	56	950	10
Chlorobenzene	1,000	680	52,267	864,000	680
Chloroethane	14,000	1,600	NR	NR	1,600
Chloroform	120	2,800	1,117	19,000	120
Chloroprene (beta-Chloroprene)	700	6,820	52,267	864,000	700
Dichlorodifluoromethane	7,000	340	522,667	NR	340
Ethyl ether (Diethyl Ether)	7,000	1,840	522,667	NR	1,840
Ethylbenzene	1,000	400	254,800	NR	400
Ethylene dibromide (EDB)	0.067	NC	0.08	1.4	0.067
Isobutyl alcohol (Isobutanol)	10,500	40,000	784,000	NR	10,500
Methacrylonitrile	3.5	2,440	261	4,320	3.5
Methyl Bromide (Bromomethane)	49	1,290	3,593	59,400	49
Methyl isobutyl ketone (4-Methyl-2-pentanone)	700	NC	71,501	NR	700
Methyl-tert-butyl Ether (MTBE)	200	1,800	13,067	216,000	200
Methylene Chloride	10	2,400	950	16,150	10
Propionitrile	NA	1,060	NT	NT	1,060
Styrene	200	1,500	522,667	NR	200
Tetrachloroethene	14	230	134	2,280	14
Toluene	1,000	650	522,667	NR	650
Trichloroethene	10	1,300	648	11,020	10
Trichlorofluoromethane	10,500	1,980	784,000	NR	1,980
Vinyl Acetate	35,000	9,200	NR	NR	9,200
Vinyl Chloride	3	1,200	3.4	57	3
Xylenes	1,000	410	NR	NR	410
SVOCs					
1,2,4-Trichlorobenzene	350	N/A	23,365	368,971	350
1,2-Dichlorobenzene	310	N/A	209,687	NR	310
1,3-Dichlorobenzene	1,000	N/A	213,282	NR	1,000

**Table 3-11**  
**Development of DPR Threshold Soil Concentrations**  
**P&W VCAP, Connecticut Facilities**

Parameter <sup>1</sup>	Draft Contained- In Policy Soil Concentration <sup>2</sup> (mg/kg)	P&W SSL for Inhalation of Trench Air (mg/kg)	P&W SSL for	P&W SSL for	DPR Threshold Soil Concentration (mg/kg)
			Ingestion & Dermal Contact Excavating Laborer (mg/kg)	Ingestion & Dermal Contact Maintenance Worker (mg/kg)	
1,4-Dichlorobenzene	150	N/A	277	4,494	150
2,4,5-Trichlorophenol	8,000	N/A	233,652	NR	8,000
2,4,6-Trichlorophenol	40	N/A	594	9,654	40
2,4-Dichlorophenol	100	N/A	6,890	108,799	100
2,4-Dimethylphenol	700	N/A	47,929	756,864	700
2,4-Dinitrophenol	70	N/A	4,793	75,686	70
2,4-Dinitrotoluene	2.6	N/A	9.2	150	2.6
2,6-Dinitrotoluene	8.4	N/A	9.2	150	8.4
2-Chlorophenol	100	N/A	11,683	184,486	100
2-Methylnaphthalene	NA	N/A	46,859	739,970	46,859
2-Methylphenol	1,750	N/A	116,826	NR	1,750
3,3-Dichlorobenzidine	13	N/A	10.2	166	10.2
4-Nitrophenol	2,170	N/A	148,578	NR	2,170
7,12-Dimethylbenz(a)anthracene	NA	N/A	NT	NT	0.33 <sup>3</sup>
Acenaphthene	2,100	N/A	140,790	NR	2,100
Acetophenone	3,500	N/A	239,643	NR	3,500
Anthracene	2,500	N/A	688,973	NR	2,500
Benz(a)anthracene	7.8	N/A	9.2	150	7.8
Benzo(a)pyrene	1	N/A	0.90	14	0.90
Benzo(b)fluoranthene	7.8	N/A	9.2	150	7.8
Benzo(g,h,i)perylene	NA	N/A	90	1,460	90
Benzo(k)fluoranthene	78	N/A	92	1,498	78
Benzyl alcohol	10,500	N/A	718,928	NR	10,500
Bis(2-chloroethoxy)methane	NA	N/A	NT	NT	0.33 <sup>3</sup>
Bis(2-chloroethyl)ether	5.2	N/A	6.1	100	5.2
Bis(2-ethylhexyl)phthalate	100	N/A	471	7,656	100
Butyl benzyl phthalate	2,000	N/A	479,285	NR	2,000
Carbazole	286	N/A	328	5,326	286
Chrysene	784	N/A	902	14,647	784
Di-n-butyl phthalate	1,400	N/A	233,652	NR	1,400
Di-n-octyl phthalate	200	N/A	47,929	756,864	200
Dibenz(a,h)anthracene	0.8	N/A	0.92	15	0.8
Dibenzofuran	140	N/A	9,586	151,373	140
Diethylphthalate	28,000	N/A	NR	NR	28,000
Dimethoate	7	N/A	479	7,569	7
Dimethylphthalate	350,000	N/A	NR	NR	350,000
Diphenylamine	875	N/A	59,911	946,080	875
Disulfoton	1.4	N/A	96	1,514	1.4
Fluoranthene	560	N/A	92,862	NR	560
Fluorene	560	N/A	92,862	NR	560
Hexachlorobenzene	2.6	N/A	4.1	67	2.6
Hexachlorocyclopentadiene	245	N/A	16,475	260,172	245
Hexachloroethane	60	N/A	471	7,656	60
Ideno(1,2,3-cd)pyrene	7.84	N/A	9.2	150	7.84
Isophorone	6,024	N/A	6,864	111,515	6,024
N-Nitroso-di-n-propylamine	0.82	N/A	0.92	15	0.82
N-Nitrosodimethylamine	0.11	N/A	0.13	2.1	0.11
N-Nitrosodiphenylamine	1,168	N/A	1,332	21,637	1,168
Naphthalene	560	N/A	92,862	NR	560
Nitrobenzene	40	N/A	1,168	18,449	40

**Table 3-11**  
**Development of DPR Threshold Soil Concentrations**  
**P&W VCAP, Connecticut Facilities**

<b>Parameter<sup>1</sup></b>	<b>Draft Contained- In Policy Soil Concentration<sup>2</sup></b>	<b>P&amp;W SSL for Inhalation of Trench Air</b>	<b>P&amp;W SSL for Ingestion &amp; Dermal Contact Excavating Laborer</b>	<b>P&amp;W SSL for Ingestion &amp; Dermal Contact Maintenance Worker</b>	<b>DPR Threshold Soil Concentration</b>
	<b>(mg/kg)</b>	<b>(mg/kg)</b>	<b>(mg/kg)</b>	<b>(mg/kg)</b>	<b>(mg/kg)</b>
o,o,o-triethyl phosphorothioate	NA	N/A	NT	NT	0.33 <sup>3</sup>
Pentachloroethane	NA	N/A	NT	NT	0.33 <sup>3</sup>
Pentachlorophenol	48	N/A	27	421	27
Phenacetine	NA	N/A	NT	NT	0.33 <sup>3</sup>
Phenol	2,500	N/A	NR	NR	2,500
Phorate	7	N/A	479	7,569	7
Pyrene	400	N/A	68,897	NR	400
Pyridine	100	N/A	2,396	37,843	100
<b>Pest/PCBs</b>					
2,4-D. (2,4-Dichlorophenoxyacetic acid)	200	N/A	23,964	378,432	200
Alachlor	71.54	N/A	82	1,327	71.54
Aldrin	0.34	N/A	0.41	7	0.34
alpha-HCH (alpha-BHC)	0.91	N/A	1.02	17	0.91
beta-HCH (beta-BHC)	3.2	N/A	4.1	67	3.2
Chlordane	0.6	N/A	5.4	90	0.6
DDD	24	N/A	31	499	24
DDE	17	N/A	20	333	17
DDT	17	N/A	22	364	17
Dieldrin	0.36	N/A	0.41	7	0.36
Endosulfan	210	N/A	14,079	222,329	210
Endosulfan Sulfate	NA	N/A	NT	NT	0.003 <sup>3</sup>
Endrin	0.4	N/A	689	10,880	0.4
Endrin Aldehyde	NA	N/A	NT	NT	0.003 <sup>3</sup>
Endrin Ketone	NA	N/A	NT	NT	0.003 <sup>3</sup>
Famphur	NA	N/A	NT	NT	0.003 <sup>3</sup>
gamma-HCH (Lindane)	4.4	N/A	5.1	83	4.4
Heptachlor	0.16	N/A	1.02	17	0.16
Heptachlor epoxide	0.16	N/A	0.72	12	0.16
Methoxychlor	200	N/A	11,683	184,486	200
PCBs	1	N/A	3.2	51	1
Toxaphene	5.2	N/A	6.1	100	5.2
<b>Inorganics</b>					
Aluminum	35,000	N/A	NR	NR	35,000
Antimony	12	N/A	1,004	16,506	12
Arsenic	10	N/A	10 <sup>5</sup>	73	10
Barium	2,000	N/A	178,050	NR	2,000
Beryllium	2	N/A	5,064	83,289	2
Cadmium	20	N/A	2,546	42,060	20
Chromium (total)	100	N/A	12,625 <sup>4</sup>	207,652 <sup>4</sup>	100
Chromium (VI)	100	N/A	12,625	207,652	100
Cobalt	2,100	N/A	155,389	NR	2,100
Copper	2,600	N/A	95,823	NR	2,600
Cyanide	400	N/A	51,796	851,904	400
Iron	10,500	N/A	776,944	NR	10,500
Lead	100	N/A	1,750	1,750	100
Magnesium	NA	N/A	NR	NR	NR
Manganese	1,750	N/A	129,491	NR	1,750
Mercury	4	N/A	745	12,246	4
Nickel	200	N/A	51,796	851,904	200
Selenium	20	N/A	12,625	207,652	20

**Table 3-11**  
**Development of DPR Threshold Soil Concentrations**  
**P&W VCAP, Connecticut Facilities**

<b>Parameter<sup>1</sup></b>	<b>Draft Contained- In Policy Soil Concentration<sup>2</sup> (mg/kg)</b>	<b>P&amp;W SSL for Inhalation of Trench Air (mg/kg)</b>	<b>P&amp;W SSL for Ingestion &amp; Dermal Contact Excavating Laborer (mg/kg)</b>	<b>P&amp;W SSL for Ingestion &amp; Dermal Contact Maintenance Worker (mg/kg)</b>	<b>DPR Threshold Soil Concentration (mg/kg)</b>
Silver	100	N/A	12,625	207,652	100
Thallium	10	N/A	177	2,915	10
Tin	21,000	N/A	NR	NR	21,000
Titanium	NA	N/A	NR	NR	NR
Vanadium	100	N/A	17,805	292,842	100
Zinc	10,000	N/A	744,571	NR	10,000

Table 3-11

**Development of DPR Threshold Soil Concentrations  
P&W VCAP, Connecticut Facilities**

<b>Parameter<sup>1</sup></b>	<b>Draft Contained-In Policy Soil Concentration<sup>2</sup></b> (mg/kg)	<b>P&amp;W SSL for Inhalation of Trench Air</b> (mg/kg)	<b>P&amp;W SSL for Ingestion &amp; Dermal Contact Excavating Laborer</b> (mg/kg)	<b>P&amp;W SSL for Ingestion &amp; Dermal Contact Maintenance Worker</b> (mg/kg)	<b>DPR Threshold Soil Concentration</b> (mg/kg)
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**Notes:**

1. List includes chemicals/analytes for which USEPA has developed Soil Screening Levels; and chemicals/analytes detected in any medium in prior sampling conducted at the VCAP facilities.
  2. Lower of :1) CTDEP's Industrial/Commercial Direct Exposure Criteria and 2) lower of either the Toxicity Characteristic concentration from 40 CFR 261.24, Table 1 (if available) and the CTDEP GA Pollutant Mobility Criteria x 100. For chemicals with no tabulated numeric values of Direct Exposure Criteria and Pollutant Mobility Criteria, numeric values were calculated using the methodology specified in the CT RSRs.
  3. The VCAP PQL will be used as the DPR threshold concentrations; these thresholds could be revised as toxicity factors become available or are developed.
  4. The toxicity factor for hexavalent chromium was used as a conservative assumption to calculate the human health-based screening level for total chromium since a toxicity factor value is not available for total chromium.
  5. Based on background concentrations used in the development of the CT Direct Exposure Criteria for soil since the risk-based value is less than background.
- NA: Draft Contained-In Policy Concentration not available.  
NC: OSHA PEL/Other Occupational Exposure Level not available to calculate SL (refer to Table 3-2)  
N/A - Not Applicable since only VOCs are expected to volatilize into trench air.  
NT: Toxicity Factor not readily available to calculate SL (refer to Table 3-10)  
NR - No Risk. Calculated Screening Level exceeds  $1 \times 10^6$  mg/kg (refer to Table 3-10), indicating that this compound does not pose a risk to this receptor at any concentration.

**Table 3-12**  
**Development of DPR Threshold Groundwater Concentrations**  
**P&W VCAP, Connecticut Facilities**

<b>Parameter<sup>1</sup></b>	<b>Draft Contained-In Policy Groundwater Concentrations<sup>2</sup></b>	<b>P&amp;W Screening Level for Inhalation of Wet Trench Air</b>	<b>P&amp;W Screening Level for Dermal Contact with Groundwater</b>	<b>DPR Threshold Groundwater Concentrations</b>
	<b>(µg/l)</b>	<b>(µg/l)</b>	<b>(µg/l)</b>	<b>(µg/l)</b>
<b>VOCs</b>				
1,1,1,2-Tetrachloroethane	100	NC <sup>6</sup>	5,000	100
1,1,1-Trichloroethane	20,000	1,330,000	1,330,000	20,000
1,1,2,2-Tetrachloroethane	50	943,941	1,887	50
1,1,2-Trichloroethane	500	1,193,174	7,143	500
1,1-Dichloroethane	7,000	5,060,000	5,060,000	7,000
1,1-Dichloroethene	700	523,564	357	357
1,2,3-Trichloropropane	50	7,852,721	77	50
1,2-Dichloroethane	500	5,454,546	7,143	500
1,2-Dichloroethene (cis)	7,000	3,500,000	1,098,901	7,000
1,2-Dichloroethene (trans)	10,000	3,500,000	1,098,901	10,000
1,2-Dichloropropane	500	2,800,000	5,000	500
1,3-Dichloropropane	50	119,165	3,448	50
1,4-Dioxane	31,800	22,782,641	769,231	31,800
2-Butanone (MEK)	200,000	23,993,691	147,058,824	200,000
Acetone	70,000	109,082,235	212,765,957	70,000
Acetonitrile	10,500	8,781,048	11,904,762	10,500
Acrylonitrile	50	134,936	4,545	50
Benzene	500	78,743	1,064	500
Bromodichloromethane (Dichlorobromomethane)	5,645	NC <sup>6</sup>	9,091	5,645
Bromoform	400	134,589	163,934	400
Carbon Disulfide	175,000	1,649,889	243,902	175,000
Carbon Tetrachloride	500	793,000	1,190	500
Chlorobenzene	100,000	472,000	472,000	100,000
Chloroethane	700,000	5,740,000	5,740,000	700,000
Chloroform	6,000	1,289,326	4,348	4,348
Chloroprene (beta-chloroprene)	35,000	2,355,816	2,439,024	35,000
Dichlorodifluoromethane	350,000	280,000	280,000	280,000
Ethylbenzene	70,000	169,000	121,951	70,000
Ethylene dibromide (EDB)	5	3,400,000	12	5
Isobutyl Alcohol (Isobutanol)	525,000	7,852,721	156,250,000	525,000
Methacrylonitrile	175	78,449	5 <sup>3</sup>	5 <sup>3</sup>
Methyl Bromide (Bromomethane)	2,450	102,204	476,190	2,450
Methyl isobutyl ketone (4-Methyl-2-pentanone)	35,000	11,894,850	5 <sup>3</sup>	5 <sup>3</sup>
Methyl-tert-butyl-ether (MTBE)	10,000	51,600	51,600	10,000
Methylene Chloride	500	13,000,000	100,000	500
Propionitrile	NA <sup>5</sup>	366,460	5 <sup>3</sup>	5 <sup>3</sup>
Styrene	10,000	310,000	310,000	10,000
Tetrachloroethene	700	200,000	179	179
Toluene	100,000	526,000	243,902	100,000
Trichloroethene	500	1,100,000	31,250	500
Trichlorofluoromethane	525,000	1,100,000	1,100,000	525,000
Vinyl Acetate	1,750,000	916,151	20,000,000	916,151
Vinyl Chloride	200	68,058	244	200
Xylenes	53,000	200,000	200,000	53,000

**Table 3-12**  
**Development of DPR Threshold Groundwater Concentrations**  
**P&W VCAP, Connecticut Facilities**

<b>Parameter<sup>1</sup></b>	<b>Draft Contained-In Policy Groundwater Concentrations<sup>2</sup></b> (µg/l)	<b>P&amp;W Screening Level for Inhalation of Wet Trench Air</b> (µg/l)	<b>P&amp;W Screening Level for Dermal Contact with Groundwater</b> (µg/l)	<b>DPR Threshold Groundwater Concentrations</b> (µg/l)
<b>SVOCs</b>				
1,2,4-Trichlorobenzene	17,500	N/A <sup>7</sup>	30,000	17,500
1,2-Dichlorobenzene	60,000	N/A <sup>7</sup>	156,000	60,000
1,3-Dichlorobenzene	60,000	N/A <sup>7</sup>	123,000	60,000
1,4-Dichlorobenzene	7,500	N/A <sup>7</sup>	1,149	1,149
2,4,5-Trichlorophenol	400,000	N/A <sup>7</sup>	555,556	400,000
2,4,6-Trichlorophenol	2,000	N/A <sup>7</sup>	2,632	2,000
2,4-Dichlorophenol	2,000	N/A <sup>7</sup>	30,303	2,000
2,4-Dimethylphenol	35,000	N/A <sup>7</sup>	111,111	35,000
2,4-Dinitrophenol	3,500	N/A <sup>7</sup>	384,615	3,500
2,4-Dinitrotoluene	130	N/A <sup>7</sup>	667	130
2,6-Dinitrotoluene	515	N/A <sup>7</sup>	1,000	515
2-Chlorophenol	3,600	N/A <sup>7</sup>	90,909	3,600
2-Methylnaphthalene	NA <sup>5</sup>	N/A <sup>7</sup>	10 <sup>3</sup>	10 <sup>3</sup>
2-Methylphenol	87,500	N/A <sup>7</sup>	1,886,792	87,500
3,3-Dichlorobenzidine	778	N/A <sup>7</sup>	222	222
4-Nitrophenol	108,500	N/A <sup>7</sup>	6,250,000	108,500
7,12-Dimethylbenz(a)anthracene	NA <sup>5</sup>	N/A <sup>7</sup>	10 <sup>3</sup>	10 <sup>3</sup>
Acenaphthene	105,000	N/A <sup>7</sup>	3,420	3,420
Acetophenone	175,000	N/A <sup>7</sup>	22,222,222	175,000
Anthracene	200,000	N/A <sup>7</sup>	45	45
Benzo(a)anthracene	6	N/A <sup>7</sup>	2.9	2.9
Benzo(a)pyrene	20	N/A <sup>7</sup>	0.2	0.2
Benzo(b)fluoranthene	8.0	N/A <sup>7</sup>	2	2
Benzo(g,h,i)perylene	NA <sup>5</sup>	N/A <sup>7</sup>	10 <sup>3</sup>	10 <sup>3</sup>
Benzo(k)fluoranthene	50	N/A <sup>7</sup>	4.3	4.3
Benzyl alcohol	525,000	N/A <sup>7</sup>	800,000	525,000
Bis(2-chloroethoxy)methane	NA <sup>5</sup>	N/A <sup>7</sup>	10 <sup>3</sup>	10 <sup>3</sup>
Bis(2-chloroethyl)ether	1,200	N/A <sup>7</sup>	714	714
Bis(2-ethylhexyl)phthalate	200	N/A <sup>7</sup>	285	200
Butyl benzyl phthalate	100,000	N/A <sup>7</sup>	42,200	42,200
Carbazole	17,500	N/A <sup>7</sup>	83	83
Chrysene	47,945	N/A <sup>7</sup>	10 <sup>3</sup>	10 <sup>3</sup>
Di-n-butylphthalate	70,000	N/A <sup>7</sup>	3,333,333	70,000
Di-n-octylphthalate	10,000	N/A <sup>7</sup>	3,000	3,000
Dibenzo(a,h)anthracene	48	N/A <sup>7</sup>	10 <sup>3</sup>	10 <sup>3</sup>
Dibenzofuran	7,000	N/A <sup>7</sup>	29,412	7,000
Diethylphthalate	1,400,000	N/A <sup>7</sup>	896,000	896,000
Dimethoate	350	N/A <sup>7</sup>	1,162,791	350
Dimethylphthalate	17,500,000	N/A <sup>7</sup>	4,320,000	4,320,000
Diphenylamine	43,750	N/A <sup>7</sup>	370,370	43,750
Disulfoton	70	N/A <sup>7</sup>	1,667	70
Fluoranthene	28,000	N/A <sup>7</sup>	206	206
Fluorene	28,000	N/A <sup>7</sup>	1,690	1,690
Hexachlorobenzene	130	N/A <sup>7</sup>	6	6

**Table 3-12**  
**Development of DPR Threshold Groundwater Concentrations**  
**P&W VCAP, Connecticut Facilities**

<b>Parameter<sup>1</sup></b>	<b>Draft Contained-In Policy Groundwater Concentrations<sup>2</sup></b>	<b>P&amp;W Screening Level for Inhalation of Wet Trench Air</b>	<b>P&amp;W Screening Level for Dermal Contact with Groundwater</b>	<b>DPR Threshold Groundwater Concentrations</b>
	<b>(µg/l)</b>	<b>(µg/l)</b>	<b>(µg/l)</b>	<b>(µg/l)</b>
Hexachlorocyclopentadiene	12,250	N/A <sup>7</sup>	2,100	2,100
Hexachloroethane	3,000	N/A <sup>7</sup>	5,882	3,000
Indeno(1,2,3-c,d)pyrene	479	N/A <sup>7</sup>	10 <sup>3</sup>	10 <sup>3</sup>
Isophorone	368,421	N/A <sup>7</sup>	434,783	368,421
N-Nitroso-di-n-propylamine	50	N/A <sup>7</sup>	83	50
N-Nitroso-dimethylamine	6.9	N/A <sup>7</sup>	128	6.9
N-Nitroso-diphenylamine	71,429	N/A <sup>7</sup>	17,241	17,241
Naphthalene	28,000	N/A <sup>7</sup>	10 <sup>3</sup>	10 <sup>3</sup>
Nitrobenzene	2,000	N/A <sup>7</sup>	45,455	2,000
o,o,o-triethyl phosphorothioate	NA <sup>5</sup>	N/A <sup>7</sup>	10 <sup>3</sup>	10 <sup>3</sup>
Pentachloroethane	NA <sup>5</sup>	N/A <sup>7</sup>	10 <sup>3</sup>	10 <sup>3</sup>
Pentachlorophenol	100,000	N/A <sup>7</sup>	22	22
Phenacetine	NA <sup>5</sup>	N/A <sup>7</sup>	10 <sup>3</sup>	10 <sup>3</sup>
Phenol	400,000	N/A <sup>7</sup>	45,454,545	400,000
Phorate	350	N/A <sup>7</sup>	10 <sup>3</sup>	10 <sup>3</sup>
Pyrene	20,000	N/A <sup>7</sup>	132	132
Pyridine	5,000	N/A <sup>7</sup>	625,000	5,000
<b>Pesticides/PCBs</b>				
2,4-D. (2,4-Dichlorophenoxyacetic acid)	10,000	N/A <sup>7</sup>	620,000	10,000
Alachlor	200	N/A <sup>7</sup>	43	43
Aldrin	21	N/A <sup>7</sup>	63	21
alpha-HCH (alpha-BHC)	56	N/A <sup>7</sup>	29	29
beta-HCH (beta-BHC)	194	N/A <sup>7</sup>	50	50
Chlordane	30	N/A <sup>7</sup>	50	30
DDD	1,458	N/A <sup>7</sup>	50	50
DDE	1,029	N/A <sup>7</sup>	40	40
DDT	1,029	N/A <sup>7</sup>	5	5
Dieldrin	0.2	N/A <sup>7</sup>	6.7	0.2
Endosulfan	10,500	N/A <sup>7</sup>	7,143	7,143
Endosulfan Sulfate	NA <sup>5</sup>	N/A <sup>7</sup>	0.1 <sup>3</sup>	0.1 <sup>3</sup>
Endrin	20	N/A <sup>7</sup>	24	20
Endrin Aldehyde	NA <sup>5</sup>	N/A <sup>7</sup>	0.1 <sup>3</sup>	0.1 <sup>3</sup>
Endrin Ketone	NA <sup>5</sup>	N/A <sup>7</sup>	0.1 <sup>3</sup>	0.1 <sup>3</sup>
Famphur	NA <sup>5</sup>	N/A <sup>7</sup>	10 <sup>3</sup>	10 <sup>3</sup>
gamma-HCH (Lindane)	269	N/A <sup>7</sup>	91	91
Heptachlor	8	N/A <sup>7</sup>	67	8
Heptachlor Epoxide	8	N/A <sup>7</sup>	350	8
Methoxychlor	10,000	N/A <sup>7</sup>	0.5 <sup>3</sup>	0.5 <sup>3</sup>
PCBs	50	N/A <sup>7</sup>	1.5	1.5
Toxaphene	500	N/A <sup>7</sup>	1 <sup>3</sup>	1 <sup>3</sup>
<b>Inorganics</b>				
Aluminum	1,750,000	N/A <sup>7</sup>	1,219,512,195	1,750,000
Antimony	600	N/A <sup>7</sup>	47,619	600
Arsenic	5,000	N/A <sup>7</sup>	2,174	2,174
Barium	100,000	N/A <sup>7</sup>	4,347,826	100,000

**Table 3-12**  
**Development of DPR Threshold Groundwater Concentrations**  
**P&W VCAP, Connecticut Facilities**

Parameter <sup>1</sup>	Draft Contained-In Policy Groundwater Concentrations <sup>2</sup> (µg/l)	P&W Screening Level for Inhalation of Wet Trench Air (µg/l)	P&W Screening Level for Dermal Contact with Groundwater (µg/l)	DPR Threshold Groundwater Concentrations (µg/l)
Beryllium	400	N/A <sup>7</sup>	7.7	7.7
Cadmium	1,000	N/A <sup>7</sup>	30,303	1,000
Chromium (total)	5,000	N/A <sup>7</sup>	625,000 <sup>9</sup>	5,000
Chromium (VI)	5,000 <sup>8</sup>	N/A <sup>7</sup>	625,000	5,000
Cobalt	105,000	N/A <sup>7</sup>	71,428,571	105,000
Copper	130,000	N/A <sup>7</sup>	29,400,000	130,000
Cyanide	200,000	N/A <sup>7</sup>	17,543,860	200,000
Iron	525,000	N/A <sup>7</sup>	370,370,370	525,000
Lead	5,000	N/A <sup>7</sup>	NR <sup>4</sup>	5,000
Magnesium	NA <sup>5</sup>	N/A <sup>7</sup>	5,000 <sup>3</sup>	5000 <sup>3</sup>
Manganese	87,500	N/A <sup>7</sup>	833,000	87,500
Mercury	200	N/A <sup>7</sup>	12,821	200
Nickel	10,000	N/A <sup>7</sup>	1,333,333	10,000
Selenium	1,000	N/A <sup>7</sup>	5,882,353	1,000
Silver	5,000	N/A <sup>7</sup>	1,818,182	5,000
Thallium	500	N/A <sup>7</sup>	5 <sup>3</sup>	5 <sup>3</sup>
Tin	1,050,000	N/A <sup>7</sup>	714,285,714	1,050,000
Titanium	NA <sup>5</sup>	N/A <sup>7</sup>	10 <sup>3</sup>	10 <sup>3</sup>
Vanadium	5,000	N/A <sup>7</sup>	2,564,103	5,000
Zinc	50,000	N/A <sup>7</sup>	90,909,091	50,000

**Notes:**

1. List includes chemicals/analytes for which USEPA has developed Soil Screening Levels; and chemicals/analytes detected in any medium in prior sampling conducted at the VCAP facilities that are also on the VCAP analytical list (included as Appendix B of Oct./Nov. Progress Report).
2. The Toxicity Characteristic Concentration from 40 CFR 261.24, Table 1, if available, or 100 x CTDEP's groundwater criteria. For chemicals with no tabulated groundwater criteria in the CT RSRs, criteria were developed using the methodology specified in the RSRs.
3. The VCAP PQL will be used as the DPR threshold concentration; these thresholds could be revised as toxicity factors become available or are developed.
4. NR - Dermal contact with lead in groundwater is not expected to pose any health risk for these receptors.
5. NA: Draft Contained-In Policy Concentration could not be calculated
6. NC: OSHA PEL/Other Occupational Exposure Level not available to calculate SL (refer to Table 3-3).
7. N/A - Not Applicable since only VOCs are expected to volatalize into trench air.
8. A Contained-In-Policy concentration value is not available for hexavalent chromium. Since hexavalent chromium is more toxic than the other chromium species, the total chromium Contained-In-Policy value for total chromium is used as a surrogate value for hexavalent chromium.
9. The toxicity factor for hexavalent chromium was used as a conservative assumption to calculate the human health-based screening level for total chromium since a toxicity factor value is not available for total chromium.